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GENERATIVE RULES FOR ITALIAN PHONOLOGY.

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TWO MODELS OF DESCRIPTION, GENERATIVE AND NONGENERATIVE, ARE APPLIED TO THE PHONOLOGY OF ITALIAN TO DETERMINE WHICH OF THE TWO OFFERS A SIMPLER YET MORE COMPREHENSIVE STATEMENT. THE NONGENERATIVE MODEL IS GIVEN IN A LISTING OF PHONEMES AND A BRIEF STATEMENT OF THE PHONOTACTICS AND ALLOPHONICS. THE GENERATIVE MODEL STATES THE FACTS IN 11 REWRITE RULES, WHICH ARE FOLLOWED BY SAMPLES OF ITALIAN WORDS GENERATED FROM THE RULES. THE CONCLUSION IS THAT THE NONGENERATIVE STATEMENT IS SHORTER AND SIMPLER, BUT THE GENERATIVE MODEL IS MORE COMPREHENSIVE. SUCCESSIVE APPLICATIONS OF THE 11 REWRITE RULES PRODUCE AN INFINITE NUMBER OF ITALIAN WORDS WHILE STAYING WITHIN THE RESTRICTIONS OF PERMISSIBLE UNITS AND ARRANGEMENTS. THIS PAPER WAS GIVEN AT THE MEETING OF THE WASHINGTON LINGUISTICS CLUB (NOVEMBER 1965) AND WAS TO BE PUBLISHED IN THE PROCEEDINGS OF THE INTERNATIONAL CONGRESS OF ROMANCE PHILOLOGY (11TH, 1965) UNDER THE TITLE "ESQUISSE D'UNE PHONOLOGIE GENERATIVE DE L'ITALIEN." (IT)

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GENERATIVE RULES FOR ITALIAN PHONOLOGY[1]

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In this paper, two models of description, generative and non-generative, are applied to the phonology of Italian in an effort to determine which of the two offers a simpler yet more comprehensive statement. The non-generative model is based on the work of Robert A. Hall, Jr. in his Descriptive Italian Grammar (1948). The model for the generative approach has been taken largely from Noam Chomsky, Syntactic Structures (1957) and Emmon Bach, An Introduction to Transformational Grammars (1964).

It should be pointed out that the analysis of phonology in generative terms without relating it to the grammatical component of the language is not universally accepted among transformationalists. It appears, however, that useful immediate results are attained in the separate treatment of the phonological component. The restrictions on the number of phonological units and their distribution facilitate explaining the steps in the formulation of generative rules.

1. The non-generative model.

1.1. The inventory of phonemes. There are seven vowel phonemes in Italian: /i e E a o O u/, all of which occur with phonemic stress (/ˊ/). Italian has twenty consonant phonemes: /p b t d č ǰ k g f v s c ź š ñ y m n l r/.

1.2. Phonotactics and allophonics. Eighteen complex vowel nuclei are possible, with either /i/ or /u/ as the semivocalic element. There are thirty consonant clusters in syllable initial position and 81 in medial position. All but five of the consonants (/c ź š ñ y/) occur in phonemically geminated and non-geminated pairs, e.g., /pápa/ - /páppa/, /fáto/ - /fátto/, /káčo/ - /káčč̆o/, etc. The five, /c ź š ñ y/, always occur geminated in medial position, with no contrast with non-geminated forms possible.

All stressed vowels are short before two consonants, e.g., ['stĕs-so]. The phoneme /s/ has a voiced allophone [z] which occurs before voiced consonants,

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e.g., ['zděň-ño]. The phoneme /n/ has a dorsovelar allophone before /k/ and /g/, e.g., ['baŋ-ko].

2. The generative model.

2.1. The re-write rules. The facts given in section 1, above, are restated in eleven re-write rules as follows:

(1) $F \longrightarrow \# S (F) \#$

(2) $S \longrightarrow C_1 V C_2$

(3) $V \longrightarrow \acute{V}$

(4) $V \longrightarrow \left\{ \begin{array}{l} (i)\left\{ \begin{array}{l} \left\{ \begin{array}{l} e \\ E \\ a \end{array} \right\}(i) \\ \left\{ \begin{array}{l} o \\ o \\ u \end{array} \right\} \end{array} \right\}(i) \\ (u)\left\{ \begin{array}{l} o \\ o \\ i \end{array} \right\}(i) \end{array} \right.$

(5) $\#C_1 \longrightarrow \left\{ \begin{array}{l} \left\{ \begin{array}{l} p \\ b \\ k \\ g \end{array} \right\}\left(\begin{array}{l} l \\ r \end{array} \right) \\ (s)\left\{ \begin{array}{l} \left\{ \begin{array}{l} t \\ d \end{array} \right\}(\dot{r}) \\ f\ l\ r\ v\ m\ n\ \check{n}\ j\ \check{c}\ c\ \acute{z}\ y \\ *\ ps \\ **\ pn \\ **\ tm \\ *\ mn \\ \emptyset \end{array} \right. \end{array} \right.$

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(6a) $C_2 \longrightarrow$ p,b,t,d,k,g,f,v,s,m,n,l,r,š,c,ź,č,ǰ,ñ,y,ø

(6b) $C_2\# \longrightarrow$ m,n,l,r,s,t,d,rt,st,lm,ø

(7a) $VsC_1 \longrightarrow Vs \left\{ \begin{array}{l} \left\{ \begin{array}{l} p \\ b \\ k \\ g \end{array} \right\} \left(\begin{array}{l} r \\ l \end{array} \right) \\ \left\{ \begin{array}{l} t \\ d \\ f \end{array} \right\} (r) \\ v \\ s \\ \check{s} \\ \check{j} \\ m \\ n \\ l \\ r \\ \emptyset \end{array} \right.$

(7b) $VrC_1 \longrightarrow Vr \left\{ \begin{array}{l} \left\{ \begin{array}{l} k \\ g \\ p \\ t \end{array} \right\} \left(\begin{array}{l} r \\ l \end{array} \right) \\ \emptyset \end{array} \right.$

(7c) $VlC_1 \longrightarrow Vl \left\{ \begin{array}{l} k \left(\begin{array}{l} l \\ r \end{array} \right) \\ \left(\begin{array}{l} t \\ f \end{array} \right) r \\ \emptyset \end{array} \right.$

(7d) $VmC_1 \longrightarrow Vm \left\{ \begin{array}{l} \left(\begin{array}{l} p \\ b \end{array} \right) \left(\begin{array}{l} l \\ r \end{array} \right) \\ \emptyset \end{array} \right.$

(7e) $VnC_1 \longrightarrow Vn \left\{ \begin{array}{l} \left\{ \begin{array}{l} k \\ g \\ l \end{array} \right\} \left(\begin{array}{l} \emptyset \\ r \end{array} \right) \\ \left\{ \begin{array}{l} t \\ d \end{array} \right\} (r) \\ \emptyset \end{array} \right.$

(7f) $V\ \emptyset\ C_1 \longrightarrow$ V (p,b,t,d,k,g,f,v,s,č,ǰ,m,n,l,r,ø)

(7g) $V \left[\begin{array}{l} \check{s} \\ c \\ \acute{z} \\ \check{c} \\ \tilde{n} \\ y \end{array} \right] C_1 \longrightarrow V \left[\begin{array}{l} \acute{s}\acute{s} \\ cc \\ \acute{z}\acute{z} \\ \check{c}\check{c} \\ \tilde{n}\tilde{n} \\ yy \end{array} \right]$

(7g) $V \begin{bmatrix} \check{s} \\ c \\ \acute{z} \\ \tilde{n} \\ y \end{bmatrix} C_1 \longrightarrow V \begin{bmatrix} \check{s}\check{s} \\ cc \\ \acute{z}\acute{z} \\ \tilde{n}\tilde{n} \\ yy \end{bmatrix}$

(7h) $V \begin{bmatrix} p \\ b \\ t \\ d \\ k \\ g \\ \check{c} \\ \check{j} \\ f \\ v \\ m \\ n \\ l \\ r \end{bmatrix} C_1 \longrightarrow V \begin{bmatrix} pp \\ bb \\ tt \\ dd \\ kk \\ gg \\ \check{c}\check{c} \\ \check{j}\check{j} \\ ff \\ vv \\ mm \\ nn \\ ll \\ rr \end{bmatrix}$

(8) $s \begin{bmatrix} b \\ d \\ g \\ v \\ m \\ n \\ l \\ \tilde{n} \\ r \end{bmatrix} \longrightarrow z \begin{bmatrix} b \\ d \\ g \\ v \\ m \\ n \\ l \\ \tilde{n} \\ r \end{bmatrix}$

(9) $V\ s\ V \longrightarrow V\ z\ V$

(10) $n \begin{bmatrix} k \\ g \end{bmatrix} \longrightarrow \eta \begin{bmatrix} k \\ g \end{bmatrix}$

(11) $\acute{V}\ C_2C_1 \longrightarrow \breve{\acute{V}}\ C_2C_1$ [ĭ,ĕ,Ĕ,ă,Ŏ,ŏ,ŭ]

The rules given above do not constitute a complete description of Italian phonology. Additional rules would be required to generate all allophones and distributional limitations. The key to the symbols used can be found by consulting Emmon Bach, op. cit. Note that the starred sequences in rule 5 (ps, pn, tm, and mn) occur in Italian but are rare.

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2.2. Sample Generations. The following are given in demonstration of how the rules may be applied to generate Italian words.

(1) # S S #
(2) # C_1 V C_2 C_1 V C_2 #
(3) # C_1 V́ C_2 C_1 V C_2 #
(4) # C_1 ó C_2 C_1 o C_2 #
(5) sbló C_2 C_1 o C_2 #
(6a) sblók C_1 o C_2 #
(6b) sblók C_1 o
(7h) sblókko
(8) zblókko
(11) zblőkko

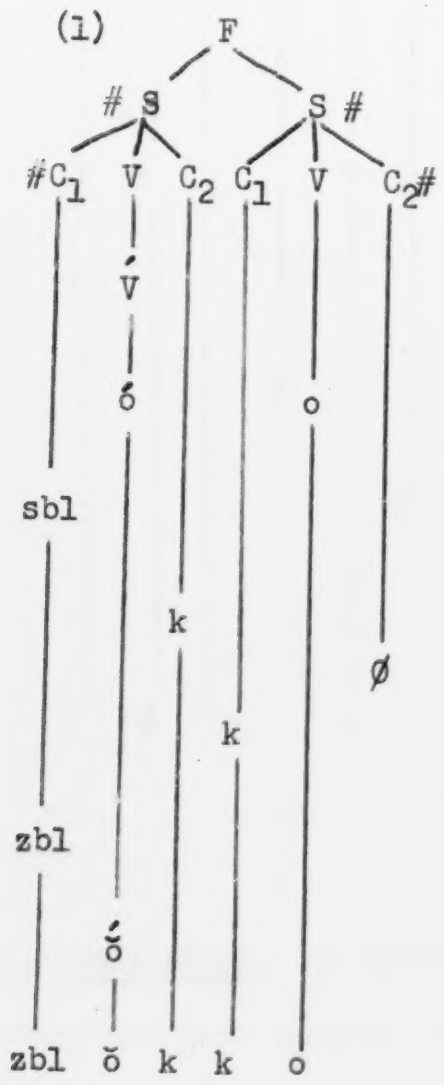
(1) # S S #
(2) # C_1 V C_2 C_1 V C_2 #
(3) # C_1 V C_2 C_1 V C_2 #
(4) # C_1 iá C_2 C_1 o C_2 #
(5) biá C_2 C_1 o C_2 #
(6a) bián C_1 o C_2 #
(6b) bián C_1 o
(7e) biánko
(10) biáŋko
(11) biáŋko

(1) # S S #
(2) # C_1 V C_2 C_1 V C_2 #
(3) # C_1 V́ C_2 C_1 V C_2 #
(4) # C_1 á C_2 C_1 o C_2 #
(5) ká C_2 C_1 o C_2 #
(6a) ká C_1 o C_2 #
(6b) ká C_1 o
(7f) káro

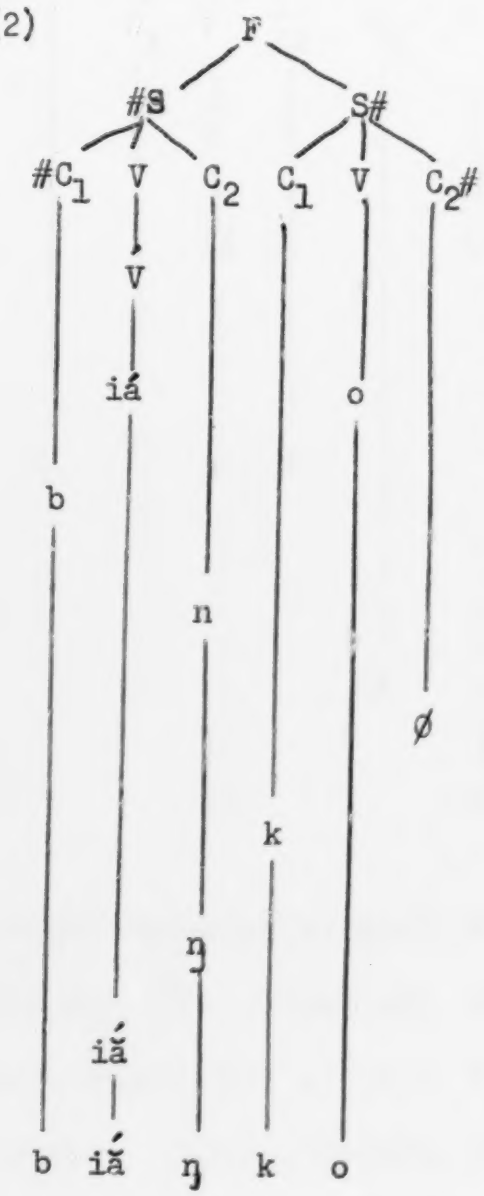
(1) # S S S #
(2) # C_1 V C_2 C_1 V C_2 C_1 V C_2 #
(3) # C_1 V C_2 C_1 V́ C_2 C_1 V C_2 #
(4) # C_1 uo C_2 C_1 iá C_2 C_1 io C_2 #
(5) kuo C_2 C_1 iá C_2 C_1 io C_2 #
(6a) kuo C_1 iá C_1 io C_2 #
(6b) kuo C_1 iá C_1 io
(7f) kuoiáio

The application of rules can be illustrated in the form of branching diagrams. The following four diagrams illustrate the generation of [zblŏ́kko], [biáŋko], [káro], and [kuoiáio], respectively:

(1)



(2)



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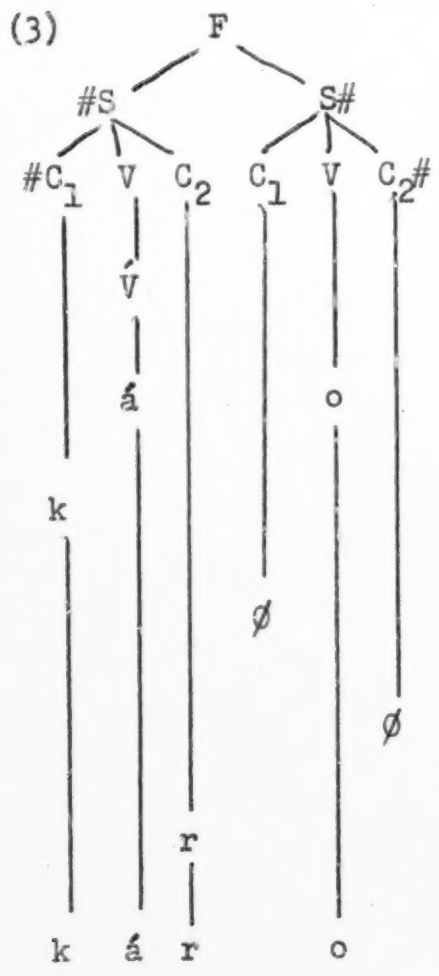
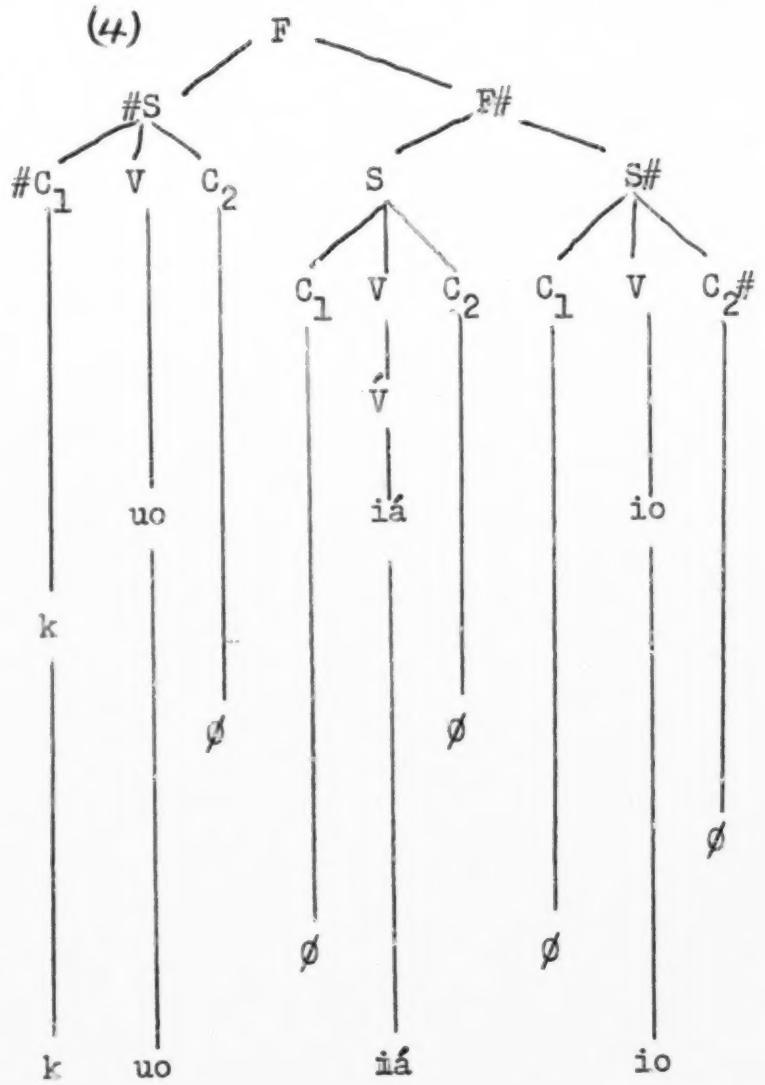
(3)



(4)



3. Conclusions. Certainly the non-generative statement, as given above, is shorter and thus simpler than the generative one. The comparison, however, is not a fair one. The non-generative statement covers only a few of the facts about Italian phonemes and their distribution. Little is said, for example, about the arrangements of consonants in clusters of 2 or 3 members and vowels in diphthongs and triphthongs. On the other hand, the generative model is more comprehensive. Successive applications of the eleven rules produce an infinite number of Italian words while staying within the restrictions of permissible units and arrangements.

[1 This paper was originally given at the November, 1965 meeting of the Washington Linguistics Club. It is part of a more detailed and expanded work to be published in the Proceedings of the Eleventh International Congress of Romance Philology, (1965) under the title "Esquisse d'une phonologie générative de l'italien".]